

Table 1. Descriptive statistics for effluent TN, TP, and Associated Coefficients of Variation for WWTPs using Biolo

Treatment Plant (State)	Process Description [†]	Design Flow (MGD)	Current % of Design Flow	Average Effluent Conc. (mg/L)*		Estimated Effluent Coefficient of Variation (CV)*	
				TN	TP	TN	TP
Butte (MT)	Membrane Bioreactor (MBR) 5-stage Bardenpho	5.5	66%	2.7	1.98	0.14	0.2
Bozeman (MT)	(biological N removal and EBOD)	8.5	73%	5.0	0.22	0.47	0.81
Palmetto (FLA)	4-stage Bardenpho	2.4	58%	2.45	0.23	0.25	0.81
Annapolis (MD)	Enhance Nutrient Reduction	6.0	78%	2.83	0.15	0.91	0.49
Bowie (MD)	Oxidation Ditch	3.3	54%	3.09	no data	0.30	no data
Largo (FLA)	A ² /O	15.0	43%	2.80	0.21	0.17	0.64
Frederick (MD)	A ² /O	8.0	78%	7.35	0.70	0.17	0.31
Westminster (MD)	MLE-A ² /O	5.0	100.0%	4.56	0.20	0.14	0.55
Cambridge (MD)	MLE	8.1	31.5%	2.35	no data	0.35	no data
Cumberland (MD)	Step Feed	15.0	62.9%	2.52	0.16	0.31	0.41

[†] Mainly from EPA, 2007. *Biological Nutrient Removal Processes and Costs*. Office of Water, Washington, D.C. EPA-8

*Descriptive statistics based on DMR data (year-round) available on EPA's ECHO site, which were expressed as mo

Table 2. 95th percentile performance from a non-random sample

95 th percentile, from DMR data, above facilities.		
95 th percentile, from WERF (2011)*		
TN (mg/L)		
Butte (MT)	3.2	Butte (MT)
Bozeman (MT)	8.1	Bozeman (MT)
Palmetto (FLA)	3.6	Palmetto (FLA)
Annapolis (MD)	6.8	Annapolis (MD)
Bowie (MD)	4.6	Bowie (MD)
Largo (FLA)	3.5	Largo (FLA)
Frederick (MD)	9.1	Frederick (MD)
Westminster (MD)	5.7	Westminster (MD)
Cambridge (MD)	3.9	Cambridge (MD)
Cumberland (MD)	3.8	Cumberland (MD)
Fiesta Village (FL)	2.71	Iowa Hill (CO)
Kulkaska (MI)	2.40	Blue Plains (DC)
Western Branch (MD)	3.20	Pinery (CO)
River Oaks (FL)	2.92	F.Wayne Hill (GA)
Truckee Meadows (NV)	2.85	Rock Creek (OR)
Scituate (MA)	4.22	ASA (VA)
Piscataway (MD)	8.00	Cauley Creek (GA)
Tahoe-Truckee (CA)	3.37	Clark County (NV)
Eastern WRF (FL)	8.56	Kalispell (MT)
Parkway (MD)	6.40	Kelowna (BC)
Group Median:	3.9	Group Median:

*Bott, C.B., and D.S. Parker, 2011. *Nutrient Management Volume II: Rem*
Water Environmental Research Foundation (WERF), Document No. NUT

gical Nutrient Removal Processes.

Notes
Since May 2016
Last 3 years
Broadneck WWTP
Exceed their TN limit
Plant is at Design Flow

23-R-07-002.

nthly averages over the past several years.

e of facilities with advanced nutrient removal.

TP (mg/L)
<i>too soon</i>
0.58
0.56
0.25
<i>no data</i>
0.60
1.07
0.40
<i>no data</i>
0.30
0.05
0.18
0.05
0.11
0.21
0.12
0.16
0.20
0.23
0.32
0.23 mg TP/L

oval Technology Performance and Reliability.
R1R06k.